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AUTHOR Martin, Jane; Sakiey, Elizabeth
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ABSTRACT

A case study was conducted in which two subjects (a ten-year-old boy and an eleven-year-old girl) classified as neurologically impaired received instruction in identifying familiar syllables within words. The object of this approach was to direct the subjects' attention to familiar letter clusters, thus facilitating word identification. Individual tutoring in this technique took place three times a week for a 16-week period. The subjects responded well, learning to rely on structural cues. The findings suggest that the technique could be valuable as part of a reading instructional program for learning disabled students. (Author/FL)

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LEARNING SIGHT WORDS BY COMBINING COMMON SYLLABLE CLUSTERS: A CASE STUDY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Jane Martin
Elizabeth Sakiey
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Jane Martin, Ed.D.
Associate Professor
Reading/Speech Correction Department
Robinson Academic Building
Glassboro State College
Glassboro, New Jersey 08028
Office Phone: 609-445-6282
Home Address: Box 505
Woodbine, New Jersey 08270
Home Phone: 609-628-2980

and

Elizabeth Sakiey, Ed.D.
Assistant Professor
Reading/Speech Correction Department
Robinson Academic Building
Glassboro State College
Glassboro, New Jersey 08028
Office Phone: 609-445-6154
Home Address: 16 Mae Drive
Yardville, New Jersey 08620
Home Phone: 609-585-6446

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LEARNING SIGHT WORDS BY COMBINING COMMON SYLLABLES: A CASE STUDY

"I could read if only I knew the words" is a lament of children with reading problems that echoes throughout our special education classrooms. And as teachers of these children we recognize the truth in such a phrase. The written words do "get in the way" for many learners handicapped in reading, for ability to identify words automatically permits the reader to attend more fully to the meaning of the message.

With this in mind, the authors conducted a case study designed to increase the sight vocabulary of two subjects having difficulty learning to read who were classified as neurologically impaired. According to the New Jersey Administrative Code (1976)

> a child shall be classified as being neurologically impaired as a result of an examination which shows evidence of specific and definable central nervous system disorder...determined by the basic child study team to be related to impairment of the educational functions of the pupil. (6:28-2.1, p. 36)

Although the label that describes them is ambiguous, there is no doubt that the two subjects were having great difficulty in learning to read despite the fact that their intelligence was judged to be within the normal range. Their strategy of guessing at words based on context clues in oral reading indicated that the two subjects could not, or would not, attend to the structure of the word. As a result, up to this point in their reading instruction, they had built up a very limited sight vocabulary.

The premise on which this case study was based was that by sensitizing the subjects to the orthography of a word we would make the task of learning sight vocabulary easier.

Research in Learning Syllables

But why should we select the syllable to be the center of focus when there is a great deal of evidence that the skilled reader usually reads whole words, not to mention whole phrases and sentences? Gleitman and Rozin (1973) asserted that application of a phonological principle is necessary for both learner and fluent reader, in order to reduce the memory burden on sight vocabulary acquisition. And the least abstract phonological unit is the syllable, the unit closest to perceptual reality. Even very young children can be heard chanting such syllables as "Sal-ly-is-a-scar-dy-cat", exhibiting a seemingly inborn awareness of these sound units (Groff, 1971).

What is a syllable and why is it closest to perceptual reality? The syllable has been the phenomenon on which phoneticians seem to agree the least. From the current syllable definitions, the one selected for this study was the "dictionary syllable", whose boundaries are determined according to traditional printing and typing conventions. Since the dictionary gives two types of syllables: the written or "graphemic" and the sound or "phonetic" one, the syllables used here are referred to as graphemic, that is, a unit of written letters.

However labeled, the syllable appears to be a natural unit of

perception. In Miller, Bruner, and Postman's now classic study (1954), pseudowords, eight letters in length, composed of different degrees or orders of approximation to English, were flashed at various time exposures. The subjects required a much longer time exposure to report all the items in a letter cluster such as DLEGQMNW, a zero-order approximation with no resemblance to an English word, than to read MOSSIANT, termed a "fourth-order approximation". Neisser (1967) suggested that there are critical features to strings of letters longer than a single letter but shorter than a word. Gibson, Pick, Osser, and Hammond (1962) also hypothesized about a "critical unit of language for the reading process" (p. 554) calling it a "spelling pattern". These patterns give specific information to the reader about how words are to be pronounced.

Investigators agree that good readers develop an ability to analyze a word according to these spelling patterns. This ability which Gibson terms "orthographic sensitivity" aids the reader in pronouncing a previously unknown word. However, there are several views on how early orthographic sensitivity develops. In a number of experiments (Gibson, Osser, & Pick, 1963; Rosinski & Wheeler, 1972) primary age children were asked to indicate the pronounceable pseudoword when pairs of pronounceable and unpronounceable letter strings were presented visually. Although first graders performed only slightly better than chance level, second and third grade students performed significantly above the chance level. It is Gibson and Levin's (1975) view that sensitivity to orthographic structure develops about the end of third grade. Other researchers, however, feel that the ability to make use of orthographic structure

develops earlier. Niles, Grunder, and Wimmer (1977) found that at the end of first grade, children could select the more word-like letter string when shown pairs of zero-order and fourth-order pseudowords.

Research needs translations into practice to be of value. Nonetheless, very few educational researchers have attempted to use the syllable as an approach to teaching reading. Jones (1970) developed reading materials that stressed the use of "closed syllables" (syllables ending with a consonant, semi-vowel or silent e) for first and third graders in Alaska. She reported significant improvement in reading skills as a result of training with these materials. In another study, Gleitman and Rozin (1973) taught six suburban and six inner-city kindergarten children to identify 23 different rebus drawings of syllables (pictures of nouns that can also double as syllables, e.g., bee + 4 = before). Words like "candle," "icy," and "pencil" were identified by combining the various picture cards. The authors concluded that the children had demonstrated an ability to recognize words on the basis of their syllables. Finally, Sakiey (1979) has identified the most frequently occurring syllables found in classroom materials from grades three to nine. She compiled a rank order list of the 322 most frequently occurring syllables using as her data base the American Heritage list of the 5,000 commonest words. (Carroll, Davies, & Richman, 1971)

This case study was designed then to determine whether teaching two children, obviously handicapped in learning to read, to pronounce commonly occurring syllables would enable them to recognize these syllables in words and thus recall more easily the pronunciation of the word.

Method

Subjects

The subjects used for this study were in a special class for the neurologically impaired. Chuck was a ten-year-old male whose intelligence, as determined by the WISC-R (Wechsler, 1974), was described as "within the normal range". The second subject, Wanda, was an eleven-year-old female whose intelligence was also described as "within the normal range". Her performance, however, was further defined as "borderline" which placed her at a somewhat lower level than Chuck. Although both subjects had received four years of reading instruction, when pre-tested on the Diagnostic Reading Scales (Spache, 1972), Chuck was reading at the primer level and Wanda at low second.

Instructional Time Period

The instructional period, conducted by the senior author, spanned 16 weeks. Twenty-four lessons in all were conducted, excluding pre- and post-testing, with each lesson lasting thirty minutes.

Measures

The two subjects were pre- and post-tested with two assessment instruments:

Diagnostic Reading Scales. This is an individually administered oral reading test in which the subjects read aloud short passages of graded difficulty. Afterwards, the subject responds to certain questions designed to measure reading comprehension of the passage. The reading

level is determined to be the highest level at which the subject meets the stipulated criteria of word recognition and comprehension.

Word Recognition Test. An instrument was designed by the investigators to test the subjects' ability to identify words in isolation. A stratified random sampling of 25 words was taken from the master vocabulary list that would be used in the instruction. Although the words in the pre- and post-tests differed, the same 25 syllables occurred on both. The list of words was presented to each subject in a "timed," "untimed," and in the post-testing, a "prompted" format. That is, the subject was shown the word briefly and asked to identify it without hesitation (timed). If the word was incorrectly identified, it was once more uncovered and the subject was given time to analyze and pronounce the word (untimed). If the subject was still unsuccessful, the examiner "prompted" him/her by supplying the three-step technique for analyzing a word according to syllables that had been taught in the tutoring sessions.

A copy of the words included in the pre- and post-test can be found in the appendix.

Preparation of the Materials

The words selected for sight vocabulary instruction were selected from the list of words included in the first eleven levels of the Macmillan Series: r (Smith, Wardhaugh, & Harris, 1975), the basal reader series used in the subjects' classroom reading program. These levels correspond to the pre-primer to low second reader level according to the Macmillan publishers.

To plan the materials the words in this list were syllabicated, using the American Heritage School Dictionary (1977) as a reference. Then words containing the same syllable were grouped together. The result proved somewhat disappointing for there were not enough examples to give adequate practice for most of the syllables. Therefore the syllables were clustered together according to common phonograms (vowel-consonant patterns). Through a series of consonant substitutions and/or additions, enough common syllables could be grouped to train the subjects. Finally the rank order of each syllable, according to the Sakiey List of Commonest Syllables, was identified. How the syllables were grouped and linked together is illustrated in Figure 1.

Insert Figure 1 about here.

Procedure

During the tutoring, regular classroom instruction in reading continued for the two subjects. The tutor's time with them was spent in supportive instruction, increasing sight vocabulary. Each sequence of lessons followed the same format:

1. The lesson was introduced with a task that required the subjects to identify the target syllable visually;
2. They were taught the pronunciation of the group of syllables that had been clustered together;
3. They combined those syllables with others to make words;
4. Each subject read the word in a sentence to confirm its pronunciation; and

Figure 1. Linking of syllables.

ar → car → far → gar → par
arch → march
ard → card → hard
ark → park
arm → farm
art → part → start
ea → sea
each → teach
eam → cream → scream
ean → bean → clean
ear → near → year
eat → treat
ur → fur → hur → sur
urn → turn
urse → nurse
urt → hurt

5. Reinforcement was supplied in the form of a game.

A detailed description of the five steps follows.

Step One, Visual Discrimination. The visual discrimination tasks varied somewhat in their content. At first the task involved a simple instruction: "Locate this syllable in this word" (e.g., el in "elephant"). When this task proved too simple, it was made more complex until it reached the point where the subject was given a stack of cards on which words were printed and told to arrange them in groups according to common syllables. The latter technique was created in accordance with Lowenstein's (1969) research conclusions, in which he points out that a search for an invariant pattern as well as a discovery of such a structure by the learner himself is necessary for transfer to take place.

Step Two, Learning the Target Syllables. One of the sight words learned by the subjects in the classroom was generally utilized as the starting point for this step. For example, the word "car" was used for the -ar group; the word "little" was used for the -le group and so on. By using the known word, the subjects extracted the target syllable and then proceeded to pronounce the other syllables in the group. So, by substituting the initial consonant of "car," they learned ar, far, gar, and par. And after the extraction of the second syllable of "little," they went on to learn -ble, -cle, -dle, -kle, -le, -ple, and -tle.

Step Three, Combining Syllables. Next the subjects combined the syllable with others to form words. Initially the tutor supplied the pronunciation of the other syllables. The task of the subjects was (1) to pronounce

the target syllable, and, once given the pronunciation of the other syllable, (2) to blend the two together to form the word. As the subjects progressed in their ability to identify the individual syllables, the tutor encouraged them to try to "figure out" the unknown syllable. If necessary she would supply a monosyllabic sight word that followed the pattern to aid them. In pronouncing the word "kettle," for example, "let" was given as a clue to ket.

Step Four, Reading the Word in a Sentence. Care was taken to be sure that each subject read the word in a sentence. An awareness of the role context plays in helping confirm the pronunciation of an unfamiliar sight word was the rationale that prompted this procedural step. Sometimes the sentences that were used contained a rebus or picture clue for another of the words in the sentence that might be unknown. This technique considerably expanded the variety of sentences that could be used. In addition, it avoided the necessity of reducing semantic clues, a problem that, in the opinion of the authors, limits the effectiveness of so called linguistic readers.

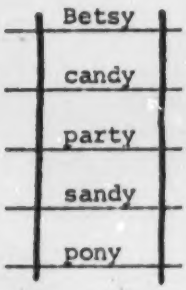
Step Five, Reinforcement Games. The games used to reinforce the sight vocabulary taught were simple ones that served as rewards as well as practice. "Bingo," "Climb the Ladder" and "Fill in the Circle" all served as motivating activities that made learning words an enjoyable experience for the two subjects. Some of the games used are illustrated in Figure 2.

Insert Figure 2 about here.

Figure 2. Games used for reinforcement.

1. "Climb the Ladder"

   Directions: (Given orally) Read the word on each step of the ladder. If you reach the top step without making a mistake, you may color the star.



2. "Color the Circle"

   Directions: (Given orally) Read the word underneath the circle. If you read the word correctly you may color the circle.

piano

faraway

pardon

another

Results

Because this study was conducted as a case study utilizing only two subjects, the analysis of the data presented here can only be descriptive. It nevertheless suggests trends that have educational implications.

In Figure 3 the word recognition growth for the two subjects is reported. Although Chuck's performance on the pre-test did not improve when he was given further time to study the word (untimed), Wanda was able to supply additional responses when given that opportunity. On the post-test Wanda repeated her pre-test performance. She supplied nine correct responses in the timed situation on the post-test as compared with the eight she had supplied on the pre-test. Her performance on the untimed task was much the same. However, when she was prompted, that is, when the systematic procedure in word identification that had been stressed during the training period was supplied,[1] Wanda was able to increase her correct response score to 18.

Chuck's performance demonstrated even more dramatic improvement. Not only was he able to identify more words in the timed portion of the post-test, his general performance indicated an ability to analyze words that

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[1]The two subjects were trained to apply the following four-step procedure in decoding the words:

1. Identify the syllables visually.
2. Pronounce each syllable.
3. Pronounce the word.
4. Confirm the pronunciation by using the context.

had not been evident on the pre-test. He doubled the number of correct responses in the untimed portion and supplied nearly 80% of the correct responses when prompted.

Insert Figure 3 about here.

Table 1 shows the subjects' performance on the Diagnostic Reading Scales. Each subject met the criteria for the next higher level on the post-test.

Insert Table 1 about here.

Table 2 contains the syllables that were taught as well as their rank order according to Sakiey's Commonest Syllables List (1979) and sight words containing these syllables. Even though the number of syllables learned was somewhat low, incipient orthographic sensitivity could be detected.

Insert Table 2 about here.

Conclusions and Discussion

Since this study was designed as a preliminary investigation utilizing two subjects, the results can only be interpreted within this framework. The project, nevertheless, revealed certain insights into a technique of word identification that utilizes syllables. The two subjects included in the study responded well to the technique. They did indeed increase their sight vocabulary, and the increment could be directly related to the syllables they learned to identify. Therefore, although

Figure 3. Performance on the Word Recognition Test.

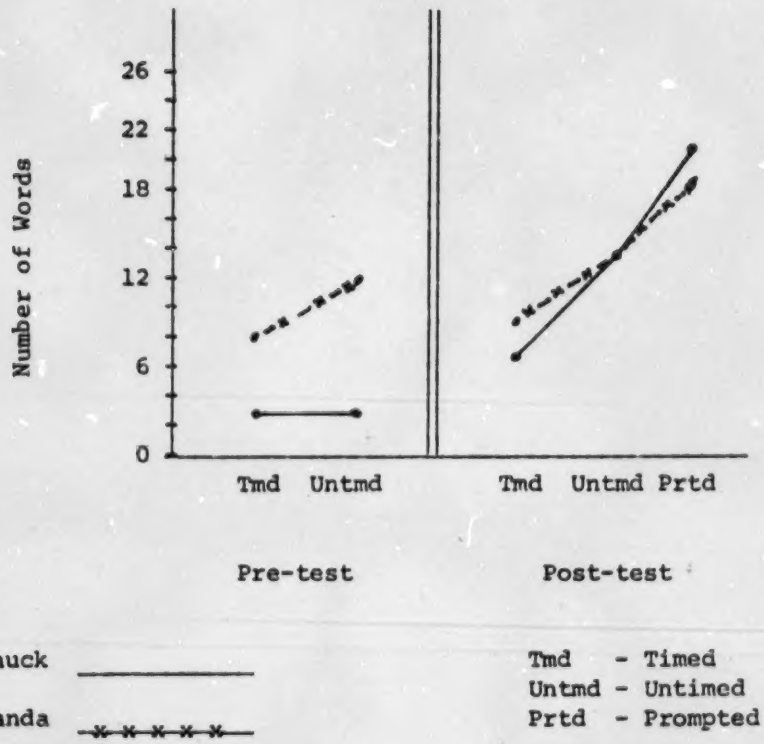

TABLE 1

Spache Diagnostic Reading Scales

	Oral Rdg.	
	pre	post
Wanda	2.3	2.8
Chucky	1.6	1.8

Note. Scores shown are instructional level.

TABLE 2

Syllables with Rank Order and Words Taught

Syllable Group		Rank Order	Words
I.	an	22	animal
	can	92	another
	dan	205[b]	any
	gan	183	anyway
	han	- [a]	began
	man	47	can't
	than	- [a]	handle
			Indian
			piano
II.	and	205[b]	Andy
	band	- [a]	band
	grand	255[b]	bandage
	hand	- [a]	grand
	land	100	grandmother
	sand	255[b]	grandpa
	stand	255[b]	grandstand
			hand
			land
			sand
			sandy
			stand
III.	-y	13	Betsy
	-dy	92	candy
	-ly	4	city
	-ny	77	family
	-py	- [a]	funny
	-ry	24	nearly
	-sy	- [a]	party
	-ty	23	pony
	-zy	- [a]	slowly
			story
			Suzy
			tiny
			very

TABLE 2 (continued)

Syllables with Rank Order and Words Taught

Syllable Group		Rank Order	Words
IV.	ar	32	faraway
	car	82	garden
	far	- [a]	pardon
	gar	- [a]	party
	par	67	
V.	el	54	doorbell
	bel	- [a]	elephant
	brel	- [a]	Isabel
	jel	- [a]	jelly
	tel	255[b]	umbrella
	yel	- [a]	yellow
VI.	et	92	basket
	bet	205	better
	get	- [a]	booklet
	jet	- [a]	forget
	ket	141	letter
	let	205	market
	net	255[b]	setter
	set	111	sunset
	vet	- [a]	velvet
VII.	-le	- [a]	bubble
	-ble	39	candle
	-cle	141	crackle
	-dle	205	handle
	-kle	- [a]	kettle
	-ple	92	needle
	-tle	67	purple
			sparkle
			table
			turtle
			uncle

Note. This table was derived from the Sakiey List of Commonest Syllables and the Macmillan Series: r master vocabulary list.

a. Although this syllable did not fall within the 322 most frequently occurring syllables, it was included because a word containing the syllable occurred on the Macmillan Series: r master vocabulary list.

b. Syllables with the same frequency of occurrence share the same rank order number.

an independent use of the syllabic technique was not mastered by either subject, there was an increased ability by both to identify words when directed to apply each step.

The study also revealed certain limitations connected with the use of such a procedure. Certain syllables proved harder to learn than others. For example -y (/ē/) created particular difficulty because the children had previously learned such sight words as by and my and transferred the -y (/ī/) pronunciation. Jones (1970) discussed this problem, which she termed "duplicity," in learning syllables. The authors agree that such negative interference must be considered in the preparation of materials that teach word recognition through syllables.

A second limitation of this technique is that it can only teach an approximation of pronunciation. It is essential that the child (1) be familiar with the word orally, (2) have very nearly the correct pronunciation, and (3) use sentence context as verification.

In addition, while the idea of adapting materials from a basal reader sounds fine in theory, in practice it does not work. The sequence used in a basal reader in introducing sight words does not usually consider common syllable patterns. There are not enough examples for some syllables. Further, there are too many sight words that simply cannot be included in any syllable group. Preparing materials that would accommodate the technique would result in a much more efficient teaching program. However, developers of future materials must keep in mind that what the child reads has to make sense. The syllable is merely a media-

tional strategy allowing the reader access to his lexicon (Tzeng & Singer, 1978-79). In addition, the initial reading vocabulary should consist of high-frequency words containing the most frequently occurring syllables. With such materials, instruction in recognition of syllables can begin early. Monosyllabic words as well as non-word syllables grouped together according to common spelling patterns could be combined to form two- and three-syllable words.

Finally, the procedure used in this study was a synthetic one. The subjects were taught the orthographic patterns. Since research indicates that proficient readers induce these patterns, a final step should be included in the instructional sequence to convert the procedure to an analytic one.

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APPENDIX

Words Included in the Pre- and Post-Word Recognition Test

Pre-test Words	Post-test Words
1. around	1. away
2. Daddy	2. had
3. hurray	3. surprise
4. silly	4. children
5. order	5. sailor
6. animal	6. family
7. bleed	7. seed
8. open	8. over
9. pound	9. sound
10. lion	10. tiny
11. always	11. baseball
12. kitten	12. listen
13. upon	13. crayon
14. uncle	14. unhappy
15. missing	15. showing
16. began	16. handle
17. farmer	17. older
18. window	18. shadow
19. umbrella	19. summer
20. happy	20. captain
21. music	21. magic
22. any	22. city
23. into	23. today
24. few	24. new
25. basket	25. master

Note. The syllables occurring on both pre- and post-tests are underlined.